

Rick Chartrand

Los Alamos National Laboratory

T-7, MS B284

Los Alamos, NM 87545

Phone: (505) 667-8093

E-mail: rickc@lanl.gov

URL: <http://math.lanl.gov/~rick>

Degrees:

Ph.D., Mathematics, University of California, Berkeley, 1999.

M.A., Mathematics, University of California, Berkeley, 1994.

B.Sc. (Hons.), Mathematics, University of Manitoba, 1993.

Professional Experience:

Technical Staff Member, Los Alamos National Laboratory, September 2005–present. Working on modeling the geometry of images and image processes in high dimensions, shape- and image-based metrics, novel forms of image reconstruction, kernel methods in high dimensions, radiographic inversions, data-informed regularizations, image warping, and cosmic-ray muon tomography.

Postdoctoral Research Associate, Los Alamos National Laboratory, October 2003–September 2005.

Research Assistant Professor, University of Illinois at Chicago, Fall 2000–Spring 2002.

Visiting Assistant Professor, Middlebury College, Fall 1999–Spring 2000.

Graduate Student Instructor, UC Berkeley, Fall 1993–Summer 1999.

Teaching Assistant, University of Manitoba, Fall 1990–Winter 1993.

Invited Presentations:

“A variational approach to reconstructing images corrupted by Poisson noise.” AMS Section Meeting, Annandale-on-Hudson, New York, October 2005.

“A gradient descent solution to the Monge-Kantorovich problem.” Clarkson University, Mathematics Colloquium, September 2004. Montana State University, DynaChat, September 2004. UCLA, Applied Mathematics Colloquium, October 2004. UC Berkeley, PDE seminar, October 2004. Georgetown University, Mathematics Colloquium, February 2005. LANL, DDMA Speaker Series, February 2005.

“Detecting nuclear materials from muon-scattering data.” Montana State University, Physics Colloquium, September 2004. American Association for the Advancement of Science, Annual Meeting, February 2005. Institute for Pure and Applied Mathematics, Graduate Summer School, July, 2005.

“Multipliers and Carleson Measures for $D(\mu)$.” AMS Section Meeting, Birmingham, Alabama, October 2000. Joint Meetings, New Orleans, January 2001. Southeastern Analysis Meeting, Athens, Georgia, March 2001. Operators and Function Theory conference, Berkeley, January, 2003.

“Toeplitz operators on $D(\mu)$.” Joint Meetings, San Antonio, January, 1999.

“Zero sets and invariant subspaces of Hilbert spaces of holomorphic functions.” AMS Section meeting, Manhattan, Kansas, March 1998.

Professional Memberships:

American Association for the Advancement of Science: nominated for Mathematics Section Board. American Mathematical Society. Society for Industrial and Applied Mathematics. Mathematical Association of America.

Symposia Organized:

“Detecting the Unseen with Cosmic-Ray Muons.” American Association for the Advancement of Science, Annual Meeting, Washington, D.C., February 2005. Four speakers from three countries. Media coverage resulted in thousands of news stories appearing across the planet.

“Mathematical Methods for the Analysis of Images and High-Dimensional Data.” American Mathematical Society, Eastern Section Meeting, Annandale-on-Hudson, New York, October 2005. Fifteen speakers.

Publications:

- [1] Rick Chartrand. Numerical differentiation of noisy, nonsmooth data. Submitted.
- [2] Rick Chartrand, Kevin R. Vixie, Brendt Wohlberg, and Erik M. Bollt. A gradient descent solution to the Monge-Kantorovich problem. Submitted.
- [3] Thomas J. Asaki, Patrick R. Campbell, Rick Chartrand, Collin E. Powell, Kevin R. Vixie, and Brendt Wohlberg. Abel inversion using total variation regularization: applications. Submitted.
- [4] Triet Le, Thomas J. Asaki, and Rick Chartrand. A variational approach to reconstructing images corrupted by Poisson noise. Submitted.
- [5] Peter Schultz, Erik M. Bollt, Rick Chartrand, Selim Esedoğlu, and Kevin R. Vixie. Graduated, adaptive image denoising: local compromise between total-variation and isotropic diffusion. Submitted.
- [6] Konstantin Borozdin, Thomas Asaki, Rick Chartrand, Mark Galassi, Andrew Greene, Nicolas Hengartner, Gary Hogan, Alexei Klimenko, Christopher Morris, William Priedhorsky, Alexander Saunders, Richard Schirato, Larry Schultz, and Matthew Sottile. Cosmic-ray muon tomography and its application to the detection of high- Z materials. In *Proceedings of the 46th Annual Meeting*. Institute of Nuclear Materials Management, 2005. To appear.
- [7] T. J. Asaki, R. Chartrand, K. R. Vixie, and B. Wohlberg. Abel inversion using total-variation regularization. *Inverse Problems*, 21:1895–1903, 2005.
- [8] Rick Chartrand and Selim Esedoğlu. Total-variation Poisson denoising via Chambolle’s duality method. In preparation.
- [9] Erik M. Bollt and Rick Chartrand. Choosing kernels for dimension reduction. In preparation.
- [10] Rick Chartrand and Peter F. Schultz. Geometry-preserving total-variation denoising. In preparation.
- [11] K. Borozdin, T. Asaki, R. Chartrand, N. Hengartner, G. Hogan, C. Morris, W. Priedhorsky, R. Schirato, L. Schultz, M. Sottile, K. Vixie, B. Wohlberg, and G. Blanpied. Information extraction from muon radiography data. In *ISAS/CITSA 2004: International Conference on Cybernetics and Information Technologies, Systems and Applications and 10th International Conference on Information*

Systems Analysis and Synthesis, Vol 2, Proceedings : Communications, Information and Control Systems, Technologies and Applications, pages 27–30. International Institute of Informatics and Systemics, 2004.

- [12] Rick Chartrand. Multipliers and Carleson measures for $D(\mu)$. *Integral Equations Operator Theory*, 45:309–318, 2003.
- [13] Rick Chartrand. Toeplitz operators on Dirichlet-type spaces. *J. Operator Theory*, 48:3–13, 2002.
- [14] Rick Chartrand. *Hilbert spaces of holomorphic functions: zero sets, invariant subspaces, and Toeplitz operators*. PhD thesis, University of California, Berkeley, 1999.
- [15] Rick Chartrand and Thomas Kucera. Deissler rank complexity of powers of indecomposable injective modules. *Notre Dame J. Formal Logic*, 35:398–402, 1994.